Appendix G

Preliminary Cost Estimates

U.S. Army Corps of Engineers 13-Mar-03

HAMILTON WETLAND PROJECT (ALTERNATIVE 5) & BEL MARIN KEYS V WETLAND RESTORATION PROJECT (ALTERNATIVE 2 REVISED

Government Planning Estimate FULLY FUNDED SUMMARY

COA		QUANTY	UOM	CONTRACT	CONTINGN	Oct 2002 Price Level TOTAL COST	FULLY FUNDED COST ESCALATED TO MIDPOINTS OF CONSTRUCTION ESCALATION	TOTAL
01	**LANDS & DAMAGES**	1	JB	**$15,918,609**	**$3,922,174**	**$19,840,783**	**$535,701**	**$20,376,484**
02	**RELOCATIONS**	1	JB	**$12,964,825**	**(included)**	**$12,964,825**	**$709,176**	**$13,674,001**
11	**LEVEES AND FLOODWALLS**	1	JB	**$58,000,188**	**$8,469,508**	**$66,469,696**	**$19,557,731**	**$86,027,427**
12	**NAVIGATION PORTS & HARBORS**	1	JB	**$149,325,135**	**$14,277,600**	**$163,602,735**	**$30,811,082**	**$194,413,817**
19	**BUILDINGS, GROUNDS & UTILITIES**	1	JB	**$159,946**	**$21,537**	**$181,483**	**$21,133**	**$202,616**
30	**PLANNING, ENGINEERING & DESIGN**	1	JB	**$21,365,000**	**$0**	**$21,365,000**	**$1,168,666**	**$22,533,666**
31	**CONSTRUCTION MANAGEMENT**	1	JB	**$17,337,193**	**$0**	**$17,337,193**	**$7,201,969**	**$24,539,162**
	TOTAL PROJECT COST			**$275,070,896**	**$26,690,819**	**$301,761,715**	**$60,005,458**	**$361,767,173**

BASIS OF COST
Bel Marin Keys Unit V Wetland Restoration Project
Alternative 2 - Revised

1. ***Project Description:*** This estimate addresses the Alternative 2 - Revised, and is based on General Reevaluation Report (GRR) – Bel Marin Keys (BMK) Unit V of the Hamilton Wetlands Restoration Projects (December 2002), the Administrative Draft - Supplemental Environmental Impact Report/Environmental Impact Statement (SEIR/EIS) to the Hamilton Wetland Restoration Plan EIS/EIR for the Bel Marin Keys Unit V Wetland Restoration Project, the Hamilton Wetland Woodward-Clyde concept plan, reference "Hamilton Wetlands Conceptual Restoration Plan" and "Technical Appendices", prepared by Woodward-Clyde for the State Coastal Conservancy, the City of Novato, April 24, 1998, and other most current estimated and investigative information from the Civil Design(ED) and Programs and Project Management Division (PPMD) of the San Francisco District, COE.

The project consists of site improvements at Bel Marin Keys Unit V property to create a beneficial reuse site for dredged materials as part of the creation of wetlands. Improvements include freshwater, tidal and seasonal wetlands, open water habitats, flood protection levees, perimeter levees, phase containment levees, internal peninsulas, excavation and borrow material relocation, channel excavation, dredge material placement and finish grading of dredged material. Other features include building removal, construction and removal of weirs, lowering and breaching of the bayward levee, breaching the Novato Creek south side levee, hydroseeding levees, a bay trail and parking lot, and monitoring and maintenance of the site. This project is expected to be constructed with land based equipment and the dredge material offloader.

Description of Alternatives:

Alternative 1: (Dredged Material Placement with Enlarged Pacheco Pond) - Restoration of tidal marsh and non-tidal transitional marsh, seasonal wetland and upland, perennial wetland and open water habitats areas with imported dredge material.

Alternative 2: (Dredged Material Placement with Seasonal Wetlands) - Restoration of tidal marsh and non-tidal transitional marsh, and seasonal wetland and upland habitats areas with imported dredge material.

Revised Alternative 2: (Dredged Material Placement with Enlarged Pacheco Pond) - Restoration of tidal marsh and non-tidal transitional marsh, seasonal wetland and upland, perennial wetland and open water habitats areas with imported dredge material.

Alternative 3: (Natural Sedimentation with Enlarged Pacheco Pond) - Restoration of tidal marsh and non-tidal transitional marsh, seasonal wetland and upland , perennial wetland and open water habitats areas with site soil and sedimentation.

For a more complete description of the Alternatives, refer to the EIS/EIR report for this project.

2. ***Pricing:*** Estimated costs are based on an Oct 2002 price level. Plant and equipment costs are from EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule, Region 7" 1999 database, "Unit Price Book" (UPB) 2001 database, and "National Labor Rates" 2000 database supplied with the MCACES program. The project labor rates have been adjusted to current State of California Wage Rate Determination sheets. Fuel costs have been adjusted for this area. Material costs are from the MCACES databases, publications and previous studies. Cost estimates from the Woodward-Clyde concept plan are also used in the MCACES estimate.

3. ***Contract Work*:** It was assumed that the prime contractor will perform all features of work, 5 days a week, 8 hours per day. No overtime work is anticipated at this time.

Major Construction Features Include:

4. ***Levee Construction:***

Expansion Alternatives

	Alternative 1	**Alternative 2**	**Revised Alternative 2**	**Alternative 3**
Earthwork				
New Levees	13,300 linear feet	15,200 linear feet	21,000 linear feet	11,400 linear feet
Improved Levees/Berms	37,500 linear feet	35,700 linear feet	36,400 linear feet	8,800 linear feet
Phase Containment Levees	30,400 linear feet	20,500 linear feet	19,200 linear feet	6,500 linear feet
Internal Peninsula/Berms	15,800 linear feet	17,900 linear feet	18,200 linear feet	26,500 linear feet
Pilot Channel Excavation	2,100 linear feet	1,800 linear feet	1,800 linear feet	1,200 linear feet

Material for levee construction would be obtained by excavating borrow material at a depth of 2 feet from designated areas within the BMK site. Material would be placed, compacted and shaped to form levees at the designated footprints. Cross-sections used in this estimate were estimated with data from the most recent investigations for Revised Alternative 2, as well as technical information from the Hamilton Wetland Restoration Feasibility Report.

The cost estimate reflects the initial construction of the levees, and the subsequent raising of said levees, in three phases/stages to address concerns from the surrounding communities. Information for the construction of the levees in stages were provided by Victor Chan - Civil Design and Edgar Salire - Geotechnical, and are as follows: (1) construction of the initial levees, (2) stage 1 construction approximately 4 years after completion of the initial construction, and (3) stage 2 construction approximately 17 years after completion of stage 2 construction. A bulking factor of 1.4 has been used where applicable per SPN Geotechnical Section.

During the Hamilton Wetland Restoration project, levees along the perimeter of the State Land (SLC) parcel and along the NSD Outfall Pipeline will be constructed during the Hamilton project to provide a separation between the Hamilton and BMK projects. After the BMK project is authorized, construction beings and the wetlands have been established, these levees will be excavated to the desired wetland restoration topographic elevation, thus

combining the Hamilton and BMK project into one. The excavated material will be used either as borrow material to either improve or raise or provide coverage material where and when necessary.

5. ***Breaching and lowering the levees*:** Breaching and lowering of the existing bayward levee, and the breaching of existing levee along the Novato Creek are the proposed plan for the revised Alternative 2.

6. ***Hamilton Levee excavation:*** The levee constructed during the Hamilton project that separates the Hamilton wetland site from the Bel Marin Keys (BMK) wetland site will be excavated down to desired elevations required by the project, after the BMK project has been authorized.

7. ***Weir and Culvert structures:*** Existing weirs inadequate to provide the desired flow of water will be removed and replaced with more adequate weirs and culverts. Construction of new culverts with flapgates will provide for the transfer of water from existing water sources into the newly created wetland, and from the newly created upland transition area to the newly tidal marsh area.

8. ***Building Demolition***: The building demolition consists of demolition, removal and disposal of buildings composed primarily of wood and sheet metal materials. Buildings range from 1000 square feet to 10,000 square feet. Site specific information of the existing buildings were provided by Victor Chan, Civil Design Section, John Azeveda, consultant to the Corps for BMK V, and Eric Polson, PE , consultant to the Corps. An estimated 50% of the buildings may or may not have lead, upon consultation with Victor Chan. Cost for lead paint removal has been added to the estimate.

9. ***Mobilization and Demobilization:*** Assume all land based plant and equipment is available locally and mobilization would take 16 hours and demobilization would take 16 hours.

10. ***Monitoring:*** Monitoring consists of initial and final fill elevations for dredged material placement using resistivity staffs and remote monitoring equipment similar to Sonoma Baylands project. The cost is from the HWRP Feasibility Report cost estimate, and the Woodward-Clyde concept report.

11. ***Finish Grading:*** Finish grading of the dredged material consists of mixing the top 2' of dredged material placement to prevent complete desiccation and cracking of the top layer. It is assumed that the dredging contractors will construct the final 2 ft. finish layer with 1 ft. of sand as the first layer and the fine-grained material for the final 1 ft. layer.

12. ***Long Term Monitoring Costs:*** Long term monitoring costs of the dredge material placed is the estimated cost of monitoring the placement of the material over a period of approximately 13 years. Costs consists of monitoring and maintenance of the levees, water control structures, tidal channel depth; aerial photos, transects monitoring, biological monitoring, water quality, and sedimentation surveys for a period of 13 years. These costs were developed by the Environmental Branch and Specifications and Cost Engineering Section, SPN.

13. ***PG&E Towers:*** There are existing PG&E towers within the newly created marsh areas. This estimate includes the cost to for concrete encasements of the tower legs at the base. The costs were referenced from the Sonoma Baylands Wetlands Restoration project completed in 1994.

14. ***Pacheco Pond Expansion:*** The estimate includes the expansion of the existing Pacheco Pond with some clearing and grubbing, tree removal, and breaching of the existing Pacheco Pond levee in several locations, thereby unifying the existing and new portions of the pond.

15. ***NSD Outfall Pipeline Modifications:*** The revised Alternatives 2 requires the modification of the existing outfall pipeline through the construction of a new section of pipeline around the east side of the newly expanded Pacheco pond. The costs were estimated based upon the existing HWRP cost for relocating this pipeline per foot of line.

16. ***Bay Trail and Parking Lot:*** Costs include the construction of a new bay trail along the perimeter of the new wetland, and constructed on the new perimeter levee itself. The cost for a new parking lot is based relatively simple site grading for a new concrete slab on aggregate base, that will accommodate approximately 20 spaces for cars.

17. ***Adaptive Management:*** The cost for adaptive management monitoring for the development of the wetland is estimated at 2% of the cost for the total project cost, based upon historical data from Corps projects.

18. ***Hydroseed of Levees:*** Hydroseeding of the new levees is based on the estimated unit costs in the HWRP Feasibility Report.

19. ***Real Estate Costs:*** Developed by Mary Leotaud, CSPEK-RE Real Estate Division in Sacramento, and Susan Miller, CESPN-PM, RE San Francisco District.

20. ***Planning, Engineering and Design (PED, Construction Management (S&A) and Engineering and Design (E&D):*** PED, S&A and E&D costs were provided by Peter Mull and Lorraine Louie, CESPN-PM, San Francisco District, with consultation with the various engineering and construction services disciplines.

21. ***MCACES Assumptions:*** 7.5% home office overhead, 8% profit; 1% bond; contingencies ranging from 10% - 20%, depending on the construction task item. Contractor field cost items for the site construction are detailed in code 11 of the MCACES. Escalation of the various cost categories, i.e. Levees and Floodwalls, Navigation, Ports and Harbors, and Buildings, Grounds and Utilities have been adjusted/escalated to reflect an estimated October 2002 price level. Reference escalation factors from the Civil Works Construction Cost Index System, 20 September 2002.

BEL MARIN KEYS ESTIMATE (GRR)
BMK V Wetland Restoration
Revised Alternative Two
Marin County, California

Designed By: Jones & Stokes
Estimated By: Jeffrey Ide

Prepared By: ITR: Sherman Fong

Preparation Date: 02/28/03
Effective Date of Pricing: 02/28/03

Sales Tax: 8.3%

	QUANTY	UOM	CONTRACT	CONTNGCY	ESCALATN	TOTAL CST	UNIT
01 Lands and Damages							
01.20 Project Design Memorandum (PDM)							
01.20.03 Real Estate Analysis Documents			103,780	15,586	0	119,366	
TOTAL Project Design Memorandum (PDM)			103,780	15,586	0	119,366	
01.23 Constructn Contract(s) Documnts							
01.23.03 Real Estate Analysis Documents			39,610	5,048	0	44,658	
TOTAL Constructn Contract(s) Documnts			39,610	5,048	0	44,658	
01.99 Associated Documentation							
01.99.01 Non-Federal Costs			150,000	15,000	0	165,000	
01.99.02 Land Value			15287361	3,821,840	0	19109201	
TOTAL Associated Documentation			15437361	3,836,840	0	19274201	
TOTAL Lands and Damages	1.00		15580751	3,857,474	0	1943822519438225	
02 Relocations							
02.03 Cemetery, Utilities, & Structure							
02.03.18 Utilities			315,000	0	9,765	324,765	
TOTAL Cemetery, Utilities, & Structure			315,000	0	9,765	324,765	
TOTAL Relocations	1.00		315,000	0	9,765	324,765	324765
11 Levees and Floodwalls							
11.01 Levees							
11.01.01 Mob, Demob & Preparatory Work	1.00	JOB	364,650	54,697	14,258	433,605	433605
11.01.03 Care & Diversion of Water	1.00	JB	966,211	147,573	37,869	1,151,653	1151653
11.01.99 Associated General Items	1.00	JB	36327966	4,739,412	1,429,519	4249689742496897	
TOTAL Levees	1.00	JB	37658827	4,941,682	1,481,646	4408215544082155	
TOTAL Levees and Floodwalls	1.00		37658827	4,941,682	1,481,646	4408215544082155	

	QUANTY	UOM	CONTRACT	CONTNGCY	ESCALATN	TOTAL CST	UNIT
12 Navigation Ports & Harbors							
12.02 Harbors							
12.02.15 Mechanical Dredging			84055000	8,405,500	3,855,603	96316103	
TOTAL Harbors			84055000	8,405,500	3,855,603	96316103	
TOTAL Navigation Ports & Harbors	1.00		84055000	8,405,500	3,855,603	96316103	96316103
19 Buildings, Grounds, & Utilities							
19.00 Buildings, Grounds, & Utilities							
19.00.22 Parking Lots and Service Roads	1.00	JB	78,616	10,135	2,502	91,253	91253
19.00.49 Streets and Public Roads	1.00	JB	76,013	11,402	2,815	90,230	90230
TOTAL Buildings, Grounds, & Utilities			154,629	21,537	5,317	181,483	
TOTAL Buildings, Grounds, & Utilities	1.00		154,629	21,537	5,317	181,483	181483
30 Planning, Engineering and Design							
30.23 Constructn Contracts(s) Documnts							
30.23.01 Plans and Specifications (P&S)	1.00	EA	4,825,000	0	0	4,825,000	4825000
30.23.02 Plan Formulation/Economics	1.00	EA	25,000	0	0	25,000	25000
30.23.04 Environmental Studies Documents	1.00	EA	250,000	0	0	250,000	250000
30.23.07 Cost Estimates	1.00	EA	530,000	0	0	530,000	530000
30.23.08 Other Studies/Investigations	1.00	EA	275,000	0	0	275,000	275000
30.23.09 Contract Award Documents	1.00	EA	20,000	0	0	20,000	20000
30.23.99 Associated Constr Docs	1.00	EA	2,000,000	0	0	2,000,000	2000000
TOTAL Constructn Contracts(s) Documnts	1.00	EA	7,925,000	0	0	7,925,000	7925000
30.24 Value Engineerng Analysis Docmnt							
30.24.01 Value Engineer'n Screen'n/Studie	3.00	EA	150,000	0	0	150,000	50000
TOTAL Value Engineerng Analysis Docmnt	1.00	EA	150,000	0	0	150,000	150000
30.25 Engrg Design During Const							
30.25.01 Engrg&Design - Const support	1.00	EA	2,435,000	0	0	2,435,000	2435000
TOTAL Engrg Design During Const	1.00	EA	2,435,000	0	0	2,435,000	2435000

	QUANTY	UOM	CONTRACT	CONTNGCY	ESCALATN	TOTAL CST	UNIT
30.26 Programs & Project Managmt Dcmnt							
30.26.01 Project Coordination Documents	1.00	EA	750,000	0	0	750,000	750000
30.26.14 All Other Progrms/Proj Mgmt Docs							
TOTAL Programs & Project Managmt Dcmnt	1.00	EA	750,000	0	0	750,000	750000
TOTAL Planning, Engineering and Design	1.00		11260000	0	0	1126000011260000	
31 Construction Management							
31.23 Construction Contracts							
31.23.11 Supervision and Administration			11118920	0	0	11118920	
TOTAL Construction Contracts			11118920	0	0	11118920	
TOTAL Construction Management	1.00	EA	11118920	0	0	1111892011118920	
TOTAL BEL MARIN KEYS ESTIMATE (GRR)	1.00		160143128	17,226,194	5,352,330	182721652********	

HAMILTON WETLANDS RESTORATION PROJECT
BASIS OF COST, 3/5/03

1. Project Description: This estimate is based on Woodward-Clyde concept plan, reference "Hamilton Wetlands Conceptual Restoration Plan" and "Technical Appendices", prepared by Woodward-Clyde for the State Coastal Conservancy, the City of Novato, April 24, 1998, Winzler & Kelly, "NSD Facilities Report", May 11, 2001, and Civil Design/Geotech Section work prepared 1/30/03. The project consists of site improvements at Hamilton Army Airfield (HAAF) and the State Lands Commission (SLC) areas to create a disposal site for dredged materials and eventually to create wetlands. Improvements would include perimeter levees, peninsula levees, containment levee, and Novato Sanitary District (NSD) pipe protection levee. Other features of the project include AC pavement removal, constructing weir structures, lowering the bayward levee, breaching the bayward levee, hydroseeding levees, NSD outfall pipe construction, dechlorination plant construction, constructing outboard marsh pilot channels, monitoring, maintenance, finish grading of dredged material, and offloading of dredged material and placement costs. This project is expected to be constructed with all land based equipment.

Description of Alternatives:

Alternative 1 (No Action Plan) - Self-explanatory.

Alternative 2 (Natural Sedimentation, HAAF) - Restoration of wetlands in HAAF area by natural sedimentation and tidal flows.

Alternative 3 (Natural Gradient, HAAF) - Restoration of wetlands in HAAF area by dredged material placement and tidal flows.

Alternative 4 (Natural Sedimentation, HAAF, SLC) - Restoration of wetlands in HAAF and SLC areas by natural sedimentation and tidal flows.

Alternative 5 (Natural Gradient, HAAF, SLC) – Restoration of wetlands in HAAF and SLC areas by dredged material placement and tidal flows.

For a more complete description of Alternatives, refer to the EIS/EIR report for this project.

2. Pricing: Estimated costs are based on a October 2002 price level. Plant and equipment costs are from EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule, Region 7, 1999 database, "Unit Price Book" (UPB) 2001 database, and "National Labor Rates" 2000 database supplied with the MCACES program. The project labor rates have been adjusted to current State of California Wage Rate Determination sheets. Fuel costs have been adjusted for this area. Material costs are from the MCACES databases, publications and previous studies. Cost estimates from the Woodward-Clyde concept plan and Winzler & Kelly, NSD Facilities Report are also used in the MCACES estimate.

Escalation factors: are from EM1110-2-1304, rev 30 Sep 02, Quarterly Indexes Table A-1. For real estate escalation use code 11.

	Oct 98	Oct 01	Oct 02
Code 02 Relocations	-	519.56	535.69
Code 11 Levees & Floodwalls	497.88	523.80	541.56
Code 12 Navigation	-	491.92	512.43

3. Contract Work: It was assumed that the prime contractor will perform all features of work, 5 days a week, 8 hours per day.

Major Construction Features Include:

4. Levee Construction, Alternative 2 - 4:

Perimeter Levee w/tidal berm: 5,600' for Alternatives 2 and 3
9,400' for Alternatives 4
Perimeter Levee: 4,100' for Alternatives 2 and 4
11,000' for Alternatives 3
Peninsula Levees: 5,800' for all Alternatives 2 - 4
Containment Levee: 2,500' for all Alternatives 2 - 4
NSD Protection Levee: 2,500' for all Alternatives 2 - 4

Levee Construction for Alternative 5:

Perimeter Levees:
Segment AB 2,600'
Segment BC 1,200'
Segment CD 4,100'
Segment DH 5,600'
Segment EFG 6,300' (SLC parcel)

Peninsula Levees: 5,800'

Separator Levees (Separates Seasonal and Tidal Wetlands construction)
Segment DJ 8,100'

Material for levee construction would be obtained by excavating borrow material at a depth of 2 feet from designated areas within the HAAF site. Material would be placed, compacted and shaped to form levees at the designated footprints. Lengths of levees and cross-sections used in this estimate were from Woodward-Clyde concept plan. The quantity of borrow material identified is not sufficient to construct the levees. The estimated quantity of borrow material identified is from BRAC estimates at 2' depth. Project manager will recommend excavating up to 8' depth to makeup for any shortfall in borrow quantity. Dredged material may possibly be used also as borrow. Levee construction is expected to take 2 years. A bulking factor of 1.4 has been used where applicable per SPN Geotechnical Section.

5. Lowering the Bayward levee consists of cutting the levee top to elevation +3.5 ft; Breaching the Bayward Levee, and; Constructing the outboard marsh pilot channels allows tidal flow into the site for wetlands creation.

6. Weir structures cost is from the Sonoma Baylands wetlands restoration project done in 1994. The Sonoma Baylands project is similar in size and scope.

7. Taxiway/apron AC pavement removal consists of demoliton and removal of three sections of taxiway/apron AC pavement for the creation of the subtidal channel. The length of the sections are 269', 175' and 182'. The assumed widths are 50' and assumed depths are 5'.

8. NSD outfall pipeline construction consists of replacing the existing outfall pipeline along the current alignment with new pipe. The estimated cost used is from the Winzler & Kelly 2001 report.

9. Dechlorination plant relocation would consist of construction of two new dechlorination stations, one at each wastewater treatment plant (Ignacio Treatment Plant and Novato Treatment Plant). The estimated cost used is from the Winzler & Kelly 2001 report.

10. Building Demolition would consists of demolition, removal and disposal of buildings composed of various materials (wood, masonry, metal, concrete). Buildings range from 150 square feet to 15,000 square feet. Costs were determined using R.S. Means, Heavy Construction Cost Data. Design and costs were developed by Eric Polson, P.E., consultant for the Sponsor and COE SPN staff. Lead abatement costs are included in the demolition cost.

11. Mobilization and demobilization: Assume all land based plant and equipment is available locally and mobilization would take 16 hours and demobilization would take 16 hours.

12. Monitoring consists of monitoring initial and final fill elevations for dredged material placement using resistivity staffs and remote monitoring equipment similar to Sonoma Baylands project. The cost is from Woodward-Clyde concept report.

13. Finish Grading consists of mixing the top 2' of dredged material placement to prevent complete dessication and cracking of the top layer. It is assumed that the dredging contractors will deposit 1' of sand 1' below the final elevation and 1' of fine-grained material at the final elevation.

14. Offloading of Dredged Material and Placement Cost includes offloader operation, mobilization & demobilization, offloader platform, pipeline, electrification, offloader equipment standby and offloader labor standby for an estimated dredged material quantity of 9,900,000 cubic yards to be offloaded and placed at Hamilton/SLC sites. This cost is included in code of accounts 12, Navigation Ports & Harbors.

15. Excess Transportation Costs consists of excess transportation costs of hauling dredged material to Hamilton instead of to their traditional designated in-Bay disposal sites. The cost has been computed based on the volume of material expected to be delivered from each of the applicable navigation projects over the life of the Hamilton project.

16. Long Term Monitoring Costs consists of monitoring and maintenance of the levees, water control structures, tidal channel depth; aerial photos, transects monitoring, biological monitoring, water quality, and sedimentation surveys for a period of 13 years (Alternatives 3,5) or 20 years (Alternatives 2, 4). These costs were developed by the Environmental Branch and Specifications and Cost Engineering Section, SPN.

17. Adaptive Management Monitoring Costs for development of the wetland are estimated at 2% of total project cost based on COE historical data.

18. Real Estate Costs: Developed by Susan Miller, Carolyn Meza, and Gayle Hayes, Real Estate Division, SPK.

19. Planning, Engineering and Design (PED) and Construction Management (S&A) costs were developed by Lorraine Louie, Peter Mull, Dave Doak, PPMD, Eric Polson, P.E., and Specifications and Cost Engineering Section, SPN.

20. MCACES Assumptions: 7.5% home office overhead, 8% profit, 1% bond, and varying contingencies and escalations based on the work item. Field cost items for levee construction are detailed in code 11 of the MCACES. Work for Building Demolition, Hydroseeding, Monitoring Dredged Material Elevations, Long Term Site Monitoring, and Adaptive Management Monitoring has been identified as potential separable contracts and have been assigned separate contractor markups. All other project work has been properly classified with appropriate markups.

21. Federal/Non-Federal Costs: This MCACES cost has not been broken out into Federal and Non-Federal costs since the cost-sharing percentages have not been identified and the Federal and local sponsor responsibilities have not been identified.

22. Project Phasing:

Phase 1: The majority of work for this project is the levee construction which will take approximately 2 years to construct.

Phase 2 (Alternates 3,5 only): Offloading and placement of dredged material to created wetland would take approximately 5 years (Only the offloading and placement cost of this work is covered under this project). Some of the dredged material offloading and placement may occur during Phase 1.

Phase 3: Lowering levee, beaching levee, construction of the outboard marsh channels, weir structures removal, hydroseeding levees, finish grading and maintenance would occur during this 2-year phase and would start approximately 1 year after completion of the dredged material offloading and placement.

Phase 4 : Long term monitoring which includes sediment survey, aerial photos, transects monitoring, tidal gages, tidal data, biological monitoring and data analysis for a 13-year period after completion of the dredged material placement. Adaptive management monitoring is for a 13-year period and occurs after completion of the dredged material placement.

CONTINGENCY PERCENTAGES

1. Mobilization and Demobilization 15% percentage was determined using an average percentage for similar type work. Cost could differ depending on transfer distances, plant availability, amount of plant required, type of plant used by the Contractor, road conditions, weather and traffic.

2. Levee Construction, Lower & Breach Bayward Levee, 15% percentage was determined using an average percentage for similar type work. Construction is relatively straight forward. Cost may change since it is based on a concept plan. Revision to the concept plan, i.e., levee lengths, cross-section, breach dimensions, and cut elevations would affect quantities assumed for this estimate. Haul roads, weather and traffic are also factors.

3. Borrow Material 35% percentage was based on the availability of the borrow material. BRAC estimates approximately 550,000 cubic yards available at 2' depth. Project manager will recommend excavation up to 8' depth to makeup for any shortfall in borrow quantity. Unknown factors such as contamination, groundwater and slope stability are factors.

4. Outboard Marsh Channels 20% percentage was based on using land-based equipment for constructing the channels. Cost may increase if the dredged material is unable to support the construction equipment which would slow production and add support costs, or if dredging equipment is brought in. Affect of tides, and weather are factors.

5. Hydroseeding Levees 10% percentage was determined using an average percentage for similar type work. Construction is relatively straight forward. Concept plan did not identify mix design. Material price is a factor.

6. Weir Structures, Remove Weir Structures 20% percentage was based on the concept plan which did not identify weir structures in the design. Cost is from Sonoma Baylands wetlands restoration project weir structures and cost would differ if design is not the same.

7. Taxiway/Apron AC Removal 20% percentage was based on the assumed removal quantities. Quantities are preliminary, and AC pavement width and depth has not been established. Pavement may be asphalt or asphalt concrete according to concept plan.

8. NSD Outfall Pipeline Construction 20% percentage was based on the W&K report. Work consists of construction of a new outfall pipe to replace the existing one along the current alignment. Cost may change since it is based on a preliminary design.

9. Dechlorination Plant Relocation 20% percentage was based on the W&K report. Work consists of construction of two new dechlorination plants to replace the existing ones. Cost may change since it is base on a preliminary design.

10. Building Demolition 25% percentage was based on design and estimates by Eric Polson, P.E., consultant for the Sponsor and COE SPN staff. Building to be demolished were identified, square footage and volumes were determined for demolition, removal and disposal costs. Costs were determined using R.S. Means, Heavy Construction Cost Data. Data is consistent with MCACES database which is developed by R.S. Means Company.

11. Monitoring 15% percentage was based on the concept plan. This monitoring design for initial and final dredged material elevations is based on the Sonoma Bayland project which was successfully used. The cost is from Woodward-Clyde concept report.

12. Finish Grading 15% percentage was based on concept plan and BCDC input. Work is fairly straight forward. Factors include the type of dredged material that would be placed on the top 2', dryness and workability of the material, and bearing support for the equipment.

13. Offloading of Dredged Material and Placement/Excess Transportation Costs 10% percentage is based on the concept plan. Cost is determined from COE dredge estimating programs and other project data. Factors would include the dredging process (availability of equipment, type, size, fuel costs, production, material type, haul distances, etc.).

14. Long Term Monitoring Costs 15% percentage is based on the concept plan, BCDC input, and COE. Work has been done before on Sonoma Baylands project and costs were determined from Sonoma Baylands project.

15. Adaptive Management Monitoring Costs 15% for development of the wetland are estimated at 2% of total project cost based on COE historical data which indicates costs in the 1% to 2% range.

15. Field Costs for Levee Construction 10% percentage is based on construction delays, accelerated schedules, and modifications to the contract.

HAMILTON WETLAND PROJECT ALT 5
Wetlands Restoration (HAAF,SLC)
Using Dredged Materials
Marin County, California

Designed By: Woodward-Clyde/Winzler&Kelly/COE
Estimated By: Phil Pang

Prepared By: San Francisco District
Specifications/Cost Engineering

Preparation Date: 01/31/03
Effective Date of Pricing: 01/31/03

Sales Tax: 8.25%

	QUANTY UOM	CONTRACT	CONTNGCY	ESCALATN	TOTAL CST	UNIT
01 Lands and Damages						
01 23 Constructn Contract(s) Documnts						
01 23.03 Real Estate Analysis Documents	1.00 JOB	305,400	64,700	32,458	402,558	402558
TOTAL Constructn Contract(s) Documnts	1.00 JOB	305,400	64,700	32,458	402,558	402558
TOTAL Lands and Damages	1.00 JOB	305,400	64,700	32,458	402,558	402558
02 Relocations						
02 03 Cemetery, Utilities, & Structure						
02 03.47 Structures, DECHLORINATION PLANT	1.00 JOB	1,260,000	0	39,060	1,299,060	1299060
02 03.97 NSD OUTFALL PIPE MODIFICATIONS	1.00 JOB	11000000	0	341,000	1134100011341000	
TOTAL Cemetery, Utilities, & Structure	1.00 JOB	12260000	0	380,060	1264006012640060	
TOTAL Relocations	1.00 JOB	12260000	0	380,060	1264006012640060	
11 Levees and Floodwalls						
11 01 Levees						
11 01.01 Mob, Demob & Preparatory Work	1.00 JOB	262,611	39,392	10,268	312,271	312271
11 01.03 Care & Diversion of Water	1.00 JOB	656,793	131,359	49,466	837,618	837618
11 01.99 Associated General Items	1.00 JOB	17195088	3,357,075	685,486	2123764821237648	
TOTAL Levees	1.00 JOB	18114493	3,527,825	745,220	2238753722387537	
TOTAL Levees and Floodwalls	1.00 JOB	18114493	3,527,825	745,220	2238753722387537	
12 Navigation Ports & Harbors						
12 02 Harbors						
12 02.15 Mechanical Dredging	9900000 CY	58721000	5,872,100	2,693,532	67286632	6.80
TOTAL Harbors	1.00 JOB	58721000	5,872,100	2,693,532	6728663267286632	
TOTAL Navigation Ports & Harbors	1.00 JOB	58721000	5,872,100	2,693,532	6728663267286632	
30 Planning, Engineering and Design						
30 23 Constructn Contracts(s) Documnts						

	QUANTY	UOM	CONTRACT	CONTNGCY	ESCALATN	TOTAL CST	UNIT
30 23.10 Engineering & Design During	1.00	EA	2,350,000	0	0	2,350,000	2350000
30 23.16 Preconstruc. Engineering, Design	1.00	EA	7,755,000	0	0	7,755,000	7755000
TOTAL Constructn Contracts(s) Documnts	1.00	JOB	10105000	0	0	1010500010105000	
TOTAL Planning, Engineering and Design	1.00	JOB	10105000	0	0	1010500010105000	
31 Construction Management							
31 23 Construction Contracts							
31 23.11 Supervision and Administration	1.00	JOB	6,218,273	0	0	6,218,273	6218273
TOTAL Construction Contracts	1.00	JOB	6,218,273	0	0	6,218,273	6218273
TOTAL Construction Management	1.00	JOB	6,218,273	0	0	6,218,273	6218273
TOTAL HAMILTON WETLAND PROJECT ALT 5	1.00	EA	105724166	9,464,625	3,851,270	119040060********	